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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/241,994	02/02/99	HICKLING R	TECHCON.001A

WM02/0314

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EXAMINER	
TSE, Y	
ART UNIT	**PAPER NUMBER**
2634	8

DATE MAILED: 03/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/241,994	Hickling
Examiner	**Group Art Unit**
Young Tse	2634

☒ Responsive to communication(s) filed on *Sep 29, 1998*

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *three* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) *1-19* is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *1-19* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). *4-7*

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed Feb 5, 2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

The PCT WO0046926 and PCT WO0079706 have not been considered because no copy has been provided by Applicant.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 250 words. It is important that the abstract not exceed 250 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract includes the word(s) “said” in line 3 and line 4.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

4. The disclosure is objected to because of the following informalities: on page 2, line 27, insert a period --.-- after the word "signal" and page 4, lines 8-11, Applicant is requested to clarify the sentence, line, 29, "an non-inverted signal" should be changed to --a non-inverted signal--. Appropriate correction is required.

Claim Objections

5. Claims 4, 14, and 17 are objected to because of the following informalities: in both claim 4 and claim 17, line 1, delete the word --further-- and line 4, "an non-inverted signal" should be changed to --a non-inverted signal--; in claim 14, line 1, "A apparatus" should be changed to --An apparatus--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. Claims 13 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13, line 6 and line 10, the phrases "said first complementary transistor network" and "said first transistor network" lack antecedent basis.

Claim 17 is vague and indefinite because it is in a method manner, however, both claim 14 and 17 are apparatus claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Miyashita et al..

Miyashita et al. "5 GHz $\Sigma\Delta$ Analog-to-Digital Converter With Polarity Alternating Feedback Comparator", IEEE, pp. 91-94, 1997 discloses a block diagram of a delta-sigma modulation circuit in figure 3 which clearly includes a pairs of V-I converters, an operational amplifier, a pairs of current sources or current switches, a level shifter or transistor network, and a PAF comparator as recited in claim 13. Also see figure 4 and page 92, col. 1, line 10 to col. 2, line 6 ~~91, line 10 to page 93, line 6.~~

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) a patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-8, 10-12, and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kotowski et al. (Applicant cited).

Kotowski et al. (U.S. Patent No. 5,561,660) discloses a method and apparatus in figures 2 and 3 for offset and phase correction in multiplexed delta-sigma modulators. Referring to figure 3, each of the delta-sigma modulator apparatus includes a negative unity gain amplifier 41, switches 43 and 45, a delta-sigma modulator 46, an inverter 47, and switches 49 and 51 for receiving an input signal 22 and providing an output 27 to a next stage. Clearly, the negative unity gain amplifier 41 and the switches 43 and 45 together could be considered as an inverter commutator and the delta-sigma modulator 46 along or the delta-sigma modulator 46, the inverter 47, and the switches 49 and 51 together could be considered as a delta-signal modulator, as recited in claims 1, 7, and 14 (col. 4, lines 41-49 and col. 6, lines 4-26).

Although Kotowski et al. does not explicitly show or suggest that the input signal 22 of the inverting commutator (the negative unity gain amplifier 41 and the switches 43 and 45) is on every one half clock cycle of a conversion clock which is also provided to the delta-sigma modulator (the delta-sigma modulator 46, tan inverter 47, and switches 49 and 51). Kotowski et al. teaches that the input signal is sampled at a sampling frequency Fs which is well above the "Nyquist frequency". The Nyquist frequency is defined as a sampling frequency trice the highest frequency of the frequency components present in the input signal (col. 1, lines 38-44 and col. 5, lines 23-26).

Applicant note a switch or multiplexer operates at a sample rate of Fs, such that each of two channels is connected to input at a rate of Fs/2. In other words, the sampling clock of the switches 43 and 45 is operated at one half the clock cycle of the input signal 22.

With respect to claims 2-3, 5-6, 10-12, 15-16, and 18-19, a modulation signal of a delta-sigma modulation circuit is derived from a front section of a receiver circuit including an antenna for receiving a radio signal, a filter for filtering a radio frequency (RF) signal or programmable controlled by a processor, and a converter for converting the RF signal into intermediate frequency (IF) signal at a center frequency or carrier frequency are well known to one of ordinary skill in the art.

With respect to claims 4, 8, and 17, the claimed limitations are clearly shown in Fig. 3.

Therefore, it would have been obvious to one of ordinary skill in the art to use a switch or multiplexer circuit for the purpose of sampling or splitting a clock from one channel into two channels like the one shown in Fig. 3 of Kotowski's delta-sigma modulator circuit by the switches 43 and 45 in order to obtain a sampling rate which is one half the clock cycle of the input signal to achieve the goal of selecting either a non-inverting signal or an inverting signal to the delta-sigma modulator 46.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kotowski et al. as applied to claim 7 above, and further in view of Ribner et al..

Kotowski et al. fails to show what circuit elements are included in the delta-sigma modulator circuit 46 as recited in claim 9.

Ribner et al. (U.S. Patent No. 5,754,131) clearly shows a delta-sigma modulator circuit in Fig. 1 which includes an amplifier circuit 18, a 1 bit a/D converter 24, a latch circuit 26 or edge-triggered comparator, a loop filter connected between the amplifier circuit 18 and the 1 bit a/D converter 24, and a 1 bit D/a converter 30.

Therefore, it would have been obvious to one of ordinary skill in the art to include an amplifier circuit, a loop filter circuit, an edge-triggered comparator, and a 1 bit D/a converter 30 in Kotowski's delta-sigma modulator circuit as taught by Ribner et al. in order to perform the proper operation as needed in Kotowski's delta-sigma modulator circuit.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

References Tiemann, Greenwood et al., Jackson, Shimada et al., Bazarjani et al., Comino et al., Gaboury, Maulik et al., and Mitama are made of record as describing a related delta-sigma modulation circuit for modulating a waveform signal into a series of digital signal controlled by a clock signal.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-9051 or (703) 308-9052, (for formal communications intended for entry)

Or:

(703) 308- 6743, (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Young Tse whose telephone number is (703) 305-4736. The examiner can normally be reached on Monday-Friday from 9:30 AM to 5:30 PM.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Young T. Tse
Primary Examiner
March 8, 2001